Claims:

1. A power meter reader system for automatically reading a power meter unit mounted on a structure that is consuming power, the power meter unit including an indication with a cyclical property having a period that varies at a rate indicative of power consumption of the structure, the system comprising:

a) a detection unit mounted on the power meter unit for monitoring the power consumption, the detection unit comprising:

i) a sensor unit disposed adjacent to the power meter for monitoring the cyclical property of the indication and generating a consumption detection signal;

ii) a processing unit connected to the sensor unit for receiving the consumption detection signal and generating an information signal, the processing unit further generating a sensor enable signal to enable the sensor unit for only a portion of the cyclical property of the indication, the portion coinciding with a time interval indicating the completion of one period of the cyclical property, the time interval being shorter than the period of the cyclical property; and,

iii) a transmitter connected to the processing unit for receiving the information signal and transmitting a transmission signal; and,

b) a display unit located remotely with respect to the detection unit, the display unit receiving the transmission signal and displaying the power consumption.

2. The system of claim 1, wherein the processing unit includes a control unit for directing the activity of the processing unit and a tracking unit connected to the control unit for tracking the cyclical property of the indication and for generating a sleep period during which the sensor enable signal disables the sensor unit.

3. The system of claim 2, wherein the sleep period is a percentage of the last value of the cyclical property of the indication.

4. The system of claim 2, wherein the sleep period is adjusted based on a history of values for the cyclical property of the indication.

5. The system of claim 1, wherein the processing unit further comprises a prediction unit for generating values for prediction model parameters to predict power consumption data derived from the consumption detection signal, and wherein the values of the prediction model parameters are incorporated into the information signal rather raw data in the consumption detection signal.

6. The system of claim 5, wherein the prediction unit updates the values of the prediction model parameters when data generated by the prediction model parameters differs from the power consumption data derived from the consumption detection signal by a value greater than a prediction error value.

7. The system of claim 6, wherein the transmitter transmits the transmission signal to the display unit every time new values for the prediction model parameters are calculated.

8. The system of claim 1, wherein the processing unit further comprises a compression unit for compressing data in the information signal.

9. The system of claim 1, wherein the detection unit further comprises a temperature unit for monitoring outdoor temperature and providing a temperature signal to the processing unit, and wherein data from the temperature signal is incorporated into the information signal.

10. The system of claim 1, wherein the display unit comprises:

c) a display processing unit for controlling the operation of the display unit;

d) a receiver connected to the display processing unit for receiving and processing the transmission signal to provide a received signal to the display processing unit;

e) a display connected to the display processing unit for displaying information related to power consumption of the structure; and,

f) an interface unit connected to the display processing unit for allowing a user to input information and select modes of operation for the display unit.

11. The system of claim 10, wherein the display unit further comprises

g) a real-time clock connected to the display processing unit for providing time information;

h) a buzzer unit connected to the display processing unit for providing audible information to the user; and,

i) a memory unit connected to the display processing unit for storing information related to power consumption of the structure.

12. The system of claim 10, wherein the display unit further comprises a communication unit connected to the display processing unit for providing a connection to an external computing device for uploading the power consumption information and downloading power consumption rates.

13. The system of claim 1, wherein the display unit comprises:

c) a display processing unit for controlling the operation of the display unit;

d) a receiver connected to the display processing unit for receiving and processing the transmission signal to provide a received signal to the display processing unit, and,

e) an appliance control unit connected to the display processing unit for controlling at least one appliance in the structure, the appliance control unit receiving at least one of temperature information, power consumption information and time information and generating an appliance

control signal for controlling an operational setting of the at least one appliance.

14. The system of claim 1, wherein the detection unit comprises:

c) a main body for housing the processing unit and the transmitter;

d) an extension member connected to the main body, the extension member having a head region for housing the sensor unit; and,

e) an attachment means connected to the main body for mounting the main body on the power meter.

15. The system of claim 14, wherein the extension member includes an extension means for extending the location of the head portion for positioning the sensor unit adjacent to a location where the indication appears.

16. The system of claim 14, wherein the extension member further includes a pivot means for positioning the extension member at a desired angle with respect to the main body.

17. The system of claim 14, wherein the attachment means includes a clamping means that slidably engages a loop member on the main body, the clamping means extending around the perimeter of the power meter unit.

18. The system of claim 1, wherein the sensor unit comprises an emitter, a first detector and a second detector, each directed towards a location where the indication appears, the emitter being disposed between the first and second detectors, the emitter being adapted to emit IR energy at the location where the indication appears, and the first and second detectors are adapted to detect a level of IR energy related to the indication, the first and second detectors providing first and second detection signals indicative of the period of the cyclical property of the indication.

19. The system of claim 18, wherein the first and second detection signals are combined using the logical AND operator to provide the consumption detection signal.

20. The system of claim 18, wherein the first and second detection signals are combined by subtracting the first and second detection signals from one another.

21. A power meter reader system for automatically reading a power meter unit mounted on a structure that is consuming power, the power meter unit including an indication with a cyclical property having a period that varies at a rate indicative of power consumption of the structure, the system comprising:

a) a detection unit mounted on the power meter unit for monitoring the power consumption, the detection unit comprising:

i) a sensor unit disposed adjacent to the power meter unit for monitoring the cyclical property of the indication and generating a consumption detection signal;

ii) a processing unit connected to the sensor unit for receiving the consumption detection signal and generating an information signal, the processing unit including a prediction unit for generating values for prediction model parameters for predicting data in the consumption detection signal and incorporating the values of the prediction model parameters into the information signal; and,

iii) a transmitter connected to the processing unit for receiving the information signal and transmitting a transmission signal;

b) a display unit located remotely with respect to the detection unit, the display unit receiving the transmission signal and displaying the power consumption of the structure based on the prediction model parameters.

22. The system of claim 21, wherein the prediction unit updates the values of the prediction model parameters when data generated by the prediction model parameters differs from data in the consumption detection signal by a value greater than a prediction error value.

23. The system of claim 22, wherein the transmitter transmits the transmission signal to the display unit every time new values for the prediction model parameters are calculated.

24. The system of claim 21, wherein the processing unit includes a control unit for directing the activity of the processing unit and a tracking unit connected to the control unit for tracking the cyclical property of the indication and for generating a sleep period during which the sensor unit is disabled, wherein the processing unit provides an enabling value in a sensor enable signal to enable the sensor unit for only a portion of the cyclical property of the indication, the portion coinciding with a time interval indicating the completion of one period of the cyclical property, the time interval being shorter than the period of the cyclical property, otherwise the sensor enable signal being adapted to disable the sensor unit based on the sleep period.

25. The system of claim 24, wherein the sleep period is a percentage of the last value of the cyclical property of the indication.

26. The system of claim 24, wherein the sleep period is adjusted based on a history of values for the cyclical property of the indication.

27. The system of claim 21, wherein the processing unit further comprises a compression unit for compressing data in the information signal.

28. The system of claim 21, wherein the detection unit further comprises a temperature unit for monitoring outdoor temperature and providing a temperature signal to the processing unit, and wherein data from the temperature signal is incorporated into the information signal.

29. The system of claim 21, wherein the display unit comprises:

c) a display processing unit for controlling the operation of the display unit;

d) a receiver connected to the display processing unit for receiving and processing the transmission signal to provide a received signal to the display processing unit;

e) a display connected to the display processing unit for displaying information related to power consumption of the structure; and,

f) an interface unit connected to the display processing unit for allowing a user to input information and select modes of operation for the display unit.

30. The system of claim 29, wherein the display unit further comprises

g) a real-time clock connected to the display processing unit for providing time information;

h) a buzzer unit connected to the display processing unit for providing audible information to the user; and,

i) a memory unit connected to the display processing unit for storing information related to the power consumption of the structure.

31. The system of claim 29, wherein the display unit further comprises a communication unit connected to the display processing unit for providing a connection to an external computing device for uploading the power consumption information and downloading power consumption rates.

32. The system of claim 21, wherein the display unit comprises:

c) a display processing unit for controlling the operation of the display unit;

d) a receiver connected to the display processing unit for receiving and processing the transmission signal to provide a received signal to the display processing unit, and,

e) an appliance control unit connected to the display processing unit for controlling at least one appliance in the structure, the appliance control unit receiving at least one of temperature information, power

consumption information and time information and generating an appliance control signal for controlling an operational setting of the at least one appliance.

33. The system of claim 21, wherein the sensor unit comprises an emitter, a first detector and a second detector, each directed towards a location where the indication appears, the emitter being disposed between the first and second detectors, the emitter being adapted to emit IR energy at a location where the indication appears, and the first and second detectors are adapted to detect a level of IR energy related to the indication, the first and second detectors providing first and second detection signals indicative of the completion of one period of the cyclical property of the indication.

34. The system of claim 33, wherein the first and second detection signals are combined using the logical AND operator to provide the consumption detection signal.

35. The system of claim 33, wherein the first and second detection signals are combined by subtracting the first and second detection signals from one another.

36. A housing for a detection unit for automatically reading a power meter unit mounted on a structure that is consuming power, the power meter unit including a indication with a cyclical property having a period that varies at a rate indicative of power consumption of the structure, the housing comprising:

a) a main body for housing internal electronics;

b) an extension member connected to the main body, the extension member having a head region for housing a sensor unit; and,

c) an attachment means connected to the main body for mounting the main body on the power meter.

37. The housing of claim 36, wherein the extension member includes an extension means for extending the location of the head portion for positioning the sensor unit adjacent to a location where the indication appears.

38. The housing of claim 36, wherein the extension member further includes a pivot means for positioning the extension member at a desired angle with respect to the main body.

39. The housing of claim 36, wherein the attachment means includes a clamping means that slidably engages a loop member on the main body, the clamping means extending around the perimeter of the power meter.

40. A detection unit for use with a power meter unit mounted on a structure that is consuming power, the power meter unit including a indication with a cyclical property having a period that varies at a rate indicative of power consumption of the structure, the detection unit mounted on the power meter unit for monitoring the power consumption, the detection unit comprising:

a) a sensor unit disposed adjacent to the power meter unit for monitoring the cyclical property of the indication and generating a consumption detection signal; and,

b) a processing unit connected to the sensor unit for receiving the consumption detection signal and generating an information signal, the processing unit further generating a sensor enable signal to enable the sensor unit for only a portion of the cyclical property of the indication, the portion coinciding with a time interval indicating the completion of one period of the cyclical property, the time interval being shorter than the period of the cyclical property.

41. The detection unit of claim 40, wherein the detection unit further comprises:

c) a control unit for directing the activity of the processing unit;

d) a tracking unit connected to the control unit for tracking the cyclical property of the indication and for generating a sleep period during which the sensor enable signal disables the sensor unit; and,

e) a transmitter connected to the processing unit for receiving the information signal and transmitting a transmission signal.

42. The detection unit of claim 41, wherein the sleep period is a percentage of the last value of the cyclical property of the indication.

43. The detection unit of claim 41, wherein the sleep period is adjusted based on a history of values for the cyclical property of the indication.

44. The detection unit of claim 40, wherein the processing unit further comprises a prediction unit for generating values for prediction model parameters to predict power consumption data derived from the consumption detection signal, and wherein the values for the prediction model parameters are used in the information signal rather than raw data in the consumption detection signal.

45. The detection unit of claim 44, wherein the prediction unit updates the values for the prediction model parameters when data generated by the prediction model parameters differs from the power consumption data derived from the consumption detection signal by a value greater than a prediction error value.

46. The detection unit of claim 40, wherein the processing unit further comprises a compression unit for compressing data in the information signal.

47. The detection unit of claim 40, wherein the detection unit further comprises a temperature unit for monitoring outdoor temperature and providing a temperature signal to the processing unit, and wherein the temperature signal is incorporated into the information signal.

48. The detection unit of claim 40, wherein the sensor unit comprises an emitter, a first detector and a second detector, each directed towards a location where the indication appears, the emitter being disposed between the first and second detectors, the emitter being adapted to emit IR energy at the location where the indication appears, and the first and second detectors are adapted to detect a level of IR energy related to the indication, the first and

second detectors providing first and second detection signals indicative of the period of the cyclical property of the indication.

49. The detection unit of claim 48, wherein the first and second detection signals are combined using the logical AND operator to provide the consumption detection signal.

50. The detection unit of claim 48, wherein the first and second detection signals are combined by subtracting the first and second detection signals from one another.

51. A detection unit for use with a power meter unit mounted on a structure that is consuming power, the power meter unit including a indication with a cyclical property having a period that varies at a rate indicative of power consumption of the structure, the detection unit mounted on the power meter unit for monitoring the power consumption, the detection unit comprising:

a) a sensor unit disposed adjacent to the power meter unit for monitoring the cyclical property of the indication and generating a consumption detection signal; and,

b) a processing unit connected to the sensor unit for receiving the consumption detection signal and generating an information signal, the processing unit including a prediction unit for generating values for prediction model parameters for predicting power consumption data derived from the consumption detection signal and incorporating the values of the prediction model parameters into the information signal.

52. The detection unit of claim 51, wherein the prediction unit updates the values of the prediction model parameters when data generated by the prediction model parameters differs from the power consumption data derived from the consumption detection signal by a value greater than a prediction error value.

53. The detection unit of claim 51, wherein the detection unit further comprises:

c) a control unit for directing the activity of the processing unit;

d) a tracking unit connected to the control unit for tracking the cyclical property of the indication and for generating a sleep period during which the sensor unit is disabled, wherein the processing unit provides an enabling value in a sensor enable signal to enable the sensor unit for only a portion of the cyclical property of the indication, the portion coinciding with a time interval indicating the completion of one period of the cyclical property, the time interval being shorter than the period of the cyclical property, otherwise the sensor enable signal being adapted to disable the sensor unit based on the sleep period.; and,

e) a transmitter connected to the processing unit for receiving the information signal and transmitting a transmission signal.

54. The detection unit of claim 53, wherein the sleep period is a percentage of the last value of the cyclical property of the indication.

55. The detection unit of claim 53, wherein the sleep period is adjusted based on a history of values for the cyclical property of the indication.

56. The detection unit of claim 53, wherein the transmitter transmits the transmission signal to the display unit every time new values for the prediction model parameters are calculated.

57. The detection unit of claim 51, wherein the processing unit further comprises a compression unit for compressing data in the information signal.

58. The detection unit of claim 51, wherein the detection unit further comprises a temperature unit for monitoring outdoor temperature and providing a temperature signal to the processing unit, and wherein the temperature signal is incorporated into the information signal.

59. The detection unit of claim 51, wherein the sensor unit comprises an emitter, a first detector and a second detector, each directed towards a

location where the indication appears, the emitter being disposed between the first and second detectors, the emitter being adapted to emit IR energy at a location where the indication appears, and the first and second detectors are adapted to detect a level of IR energy related to the indication, the first and second detectors providing first and second detection signals indicative of the period of the cyclical property of the indication.

60. The detection unit of claim 59, wherein the first and second detection signals are combined using the logical AND operator to provide the consumption detection signal.

61. The detection unit of claim 59, wherein the first and second detection signals are combined by subtracting the first and second detection signals from one another.

62. A method for automatically reading a power meter unit mounted on a structure that is consuming power, the power meter unit including an indication with a cyclical property having a period that varies at a rate indicative of power consumption of the structure, the method comprising:

a) sensing a variation of the cyclical property of the indication using a sensor unit and generating a consumption detection signal;

b) generating an information signal based on data from the consumption detection signal; and,

c) generating a sensor enable signal to enable the sensor unit for only a portion of the cyclical property of the indication, the portion coinciding with a time interval indicating the completion of one period of the cyclical property, the time interval being shorter than the period of the cyclical property.

63. The method of claim 62, wherein the method further comprises:

d) transmitting a transmission signal based on the information signal;

and at a remote location relative to the power meter unit,

e) receiving and processing the transmission signal for obtaining power consumption information; and,

f) displaying the power consumption information.

64. The method of claim 62, wherein step (a) includes:

d) tracking the cyclical property of the indication for generating a sleep period during which the sensor enable signal disables the sensor unit.

65. The method of claim 64, wherein the method further comprises generating the sleep period as a percentage of the last value of the cyclical property of the indication.

66. The method of claim 64, wherein the method further comprises generating the sleep period based on a history of values for the cyclical property of the indication.

67. The method of claim 62, wherein step (b) includes generating values for prediction model parameters to predict power consumption data derived from the consumption detection signal.

68. The method of claim 67, wherein the method further includes updating the values for the prediction model parameters when data generated by the prediction model parameters differs from the power consumption data derived from the consumption detection signal by a value greater than a prediction error value.

69. The method of claim 63, wherein step (d) includes compressing data in the information signal to produce the transmission signal.

70. The method of claim 62, wherein step (b) includes monitoring outdoor temperature and incorporating temperature data into the information signal.

71. The method of claim 63, wherein the method further includes:

g) storing information related to the power consumption of the structure; and,

h) predicting future power consumption of the structure based on the stored information.

72. The method of claim 63, wherein the method further includes providing a connection to an external computing device for uploading the power consumption information and downloading power consumption rates.

73. The method of claim 62, wherein the method further comprises generating an appliance control signal for controlling an operational setting of at least one appliance in the structure, the appliance control signal being generated based on at least one of temperature information, power consumption information and time information.

74. A method for automatically reading a power meter unit mounted on a structure that is consuming power, the power meter unit including an indication with a cyclical property having a period that varies at a rate indicative of power consumption of the structure, the method comprising:

a) sensing a variation of the cyclical property of the indication using a sensor unit and generating a consumption detection signal; and,

b) generating an information signal based on data from the consumption detection signal by generating values for prediction model parameters to predict power consumption data derived from the consumption detection signal and including the values of the prediction model parameters in the information signal.

75. The method of claim 74, wherein the method further comprises:

c) transmitting a transmission signal based on the information signal;

and at a remote location relative to the power meter unit,

d) receiving and processing the transmission signal for obtaining power consumption information; and,

e) displaying the power consumption information.

76. The method of claim 74, wherein step (b) includes updating the values for the prediction model parameters when data generated by the prediction model parameters differs from the power consumption data derived from the consumption detection signal by a value greater than a prediction error value.

77. The method of claim 75, wherein step (c) includes transmitting the transmission signal every time new values for the prediction model parameters are calculated.

78. The method of claim 74, wherein step (a) includes:

c) tracking the cyclical property of the indication for generating a sleep period during which a sensor enable signal disables the sensor unit; and,

d) generating the sleep period during which the sensor unit is disabled by providing an enabling value in the sensor enable signal to enable the sensor unit for only a portion of the cyclical property of the indication, the portion coinciding with a time interval indicating the completion of one period of the cyclical property, the time interval being shorter than the period of the cyclical property, otherwise the sensor enable signal being adapted to disable the sensor unit based on the sleep period.

79. The method of claim 78, wherein the method further comprises generating the sleep period as a percentage of the last value of the cyclical property of the indication.

80. The method of claim 78, wherein the method further comprises generating the sleep period based on a history of values for the cyclical property of the indication.

81. The method of claim 75, wherein step (c) includes compressing data in the information signal to produce the transmission signal.

82. The method of claim 74, wherein step (b) includes monitoring outdoor temperature and incorporating temperature data into the information signal.

83. The method of claim 75, wherein the method further includes:

f) storing information related to the power consumption of the structure; and,

g) predicting future power consumption of the structure based on the stored information.

84. The method of claim 75, wherein the method further includes providing a connection to an external computing device for uploading the power consumption information and downloading power consumption rates.

85. The method of claim 74, wherein the method further comprises generating an appliance control signal for controlling an operational setting of at least one appliance in the structure, the appliance control signal being generated based on at least one of temperature information, power consumption information and time information.